

# NAVAL POSTGRADUATE SCHOOL

## Monterey, California



## THESIS

**HOW THE IMPLEMENTATION OF PERFORMANCE  
BASED CONTRACTING HAS AFFECTED  
PROGRAM MANAGEMENT WITHIN THE  
DEPARTMENT OF DEFENSE**

by

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December 1998

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WITHIN THE DEPARTMENT OF DEFENSE**

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Submitted in partial fulfillment of the  
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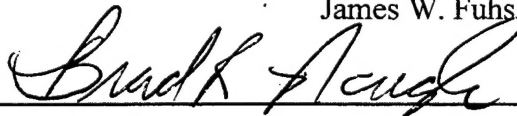
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## **ABSTRACT**

The objective of this research is to investigate the impact that performance based contracting (PBC) can have on program management in the Department of Defense. Interviews are utilized to gather information from Army, Navy, and Marine Corps Program Management Offices involved in the acquisition process. The study identifies how program management has been affected by the implementation of PBC and describes its use in three DoD acquisition programs. The advantages, disadvantages, and risks associated with PBC are analyzed to determine potential areas for improvement of the process, and the study develops guidelines that future program managers can use in the setup of PBC acquisitions. Based on key findings and conclusions, the study recommends the Government determine metrics for measurement of the effectiveness and efficiency of PBC, evaluate the waiver process associated with this initiative, and increase the training opportunities for the acquisition workforce. The study further recommends that DoD establish a marketing plan to foster positive cultural change towards PBC and outlines a number of areas for further research.



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## **I. INTRODUCTION**

### **A. MOTIVATION**

During the past several years, the Department of Defense has been transitioning from a heavily bureaucratic organization in the area of acquisition management to a streamlined business oriented approach. This has occurred because of the declining amount of resources available to DoD while still needing to modernize and become more efficient in all areas of operations. One area where acquisition reform has been substantial is in the area of Contract Management.

This reform process has created a need for acquisition personnel at all levels to change the way they do business. One of the significant areas is in moving away from military specifications to commercial specifications and using performance based objectives and specifications to procure the goods and services necessary to accomplish the DoD mission in the shortest period of time possible.

Performance based contracting emphasizes telling the contractor what results must be achieved as opposed to specifying a certain method for their completion. The use of performance based contracting methods is supposed to enhance the Government's ability to acquire high quality goods and services and ensure adequate contractor performance. Performance based contracting is a key element in Government-wide acquisition streamlining initiatives. Performance based contracting techniques give contractors more freedom to innovate and economize, yet at the same time, holds them accountable for end results.

The motivation for conducting this research is to determine how current experiences with performance based contracting can be used to improve the acquisition process in the Department of Defense. This thesis will identify how performance based contracting may help program managers get their systems to the users in a shorter time period, while meeting the end users' requirements and allowing costs to be controlled without sacrificing quality.

## **B. RESEARCH OBJECTIVE**

The goal of this research is to determine the effect that the transition to performance based contracting is having on the Department of Defense in the area of program management. The use of performance based contracting in DoD program management is fairly recent and is a significant change. An analysis of this area will help to determine the benefits and concerns of using performance based contracting and develop guidelines to improve the effectiveness of its use.

## **C. RESEARCH QUESTIONS**

The primary research question is: In what respects have performance based contracts improved Department of Defense acquisitions? The subsidiary questions are as follows:

1. What are the advantages, disadvantages, and risks associated with performance based contracting?
2. What are the current initiatives and barriers that promote/hinder the use of performance based contracting and can they be enhanced/mitigated?

3. How can performance based contracting be changed to improve the acquisition process?
4. What guidelines can be used by future program managers to improve the effectiveness of performance based contracting?

#### **D. SCOPE, LIMITATIONS AND ASSUMPTIONS**

The scope of the thesis will be limited to the case studies of the use of performance based contracting in the AAV Program Management Office, the 2 1/2-ton Truck Extended Service Program, and the LPD-17 Program. The study will explore the methods used and decisions made by various personnel within the program office in using performance based contracting within these programs. A review of the lessons learned through these case studies in conjunction with the information gathered from outside of these programs will be used to develop a generic model of how to use performance based contracting in future weapon systems programs. This study was prepared while all three programs are still in various stages of life cycle management. This limits the study from drawing any final conclusions on the success or failure of performance based contracting and its use in the acquisition of DoD programs. This study is also limited in that many of the guidelines for Government agencies in regards to the use of performance based contracting are in draft form. The final policies have not been determined due to the lack of experience in the area of performance based contracting among Government programs. This study assumes that the reader has a general knowledge or familiarity with Government contracting and program management.

## **E. METHODOLOGY**

To answer the primary and subsidiary questions, two research methods were employed. First, a comprehensive review of the available literature as well as the applicable laws and regulations dealing with performance based contracting was conducted. This literature review consisted of the Naval Postgraduate School library, the Internet, and theses from various graduate programs.

Second, interviews were conducted in person, by telephone, or by electronic mail with various personnel involved in the acquisition process of the three DoD programs that have been using performance based contracting in the execution of the program. I also interviewed personnel who are using performance based contracting at field level activities or are responsible or familiar with performance based contracting policy to obtain a perspective from outside of the program offices.

## **F. ORGANIZATION OF STUDY**

The research is organized in the following manner: Chapter I presented the motivation and research questions for the study. Chapter II will address the background that led to performance based contracting, and a description of the primary differences between traditional and performance based contracting. Chapter III will provide the methodology of the data collection and the background of the programs studied. Chapter IV will provide an analysis of the data collected for this thesis. Chapter V will provide conclusions derived from the

research, recommendations and a summary of answers to the primary and subsidiary research questions as well as areas of further research.



## **II. BACKGROUND**

### **A. INTRODUCTION**

Performance based contracting means structuring all aspects of an acquisition around the purpose of the work to be performed, as opposed to either the manner by which the work is to be performed or broad and imprecise statements of work. [Ref. 1:p. 1] Performance based contracting emphasizes telling the contractor what results must be achieved as opposed to specifying a certain method for their completion. The purpose of performance based contracting is to enhance the Government's ability to acquire high quality products and services as well as ensuring adequate contractor performance.

Performance based contracting is a key element in Government-wide acquisition streamlining initiatives. Systems are usually designed and built to meet performance specifications or a functional specification is included with a requirement for performance tests. Performance based contracting techniques give contractors more freedom to innovate and economize; yet at the same time, it holds them accountable for the end results.

The statement of work sets the standards for the measurement of performance effectiveness during the contract performance and upon contract completion. The work description should establish guidelines and goals that become standards against which performance is measured. A key purpose of performance based contracting is to provide a means to ensure that appropriate performance quality



level is achieved and the payment is made only for goods and services which meet contract standards. [Ref. 2:pp. 2-3]

## **B. HISTORICAL PERSPECTIVE**

Secretary of Defense William Perry in June of 1994 released a Memorandum entitled *Specifications and Standards – A New Way of Doing Business*. In this memorandum, he discussed how DoD needs to increase its access to commercial state of the art technology and must facilitate the adoption by its suppliers of business processes characteristic of world class suppliers. In addition, integration of commercial and military development and manufacturing facilitates the development of dual-use processes and products, and contributes to an expanded industrial base that is capable of meeting defense needs at lower costs.

He went on to state that moving to greater use of performance and commercial specifications and standards is one of the most important actions that DoD must take to ensure it is able to meet military, economic, and policy objectives in the future. Moreover, the Vice President's National Performance Review recommended that agencies avoid Government unique requirements and rely more on the commercial marketplace.

To accomplish this objective, the Deputy Under Secretary of Defense (Acquisition Reform) chartered a Process Action Team to develop a strategy and a specific plan of action to decrease reliance, to the maximum extent practicable, on military specifications and standards. The Process Action Team report, *Blueprint*

*for Change*, identified the tasks necessary to achieve this objective. The Secretary accepted the Team's report and approved the primary recommendation to use performance and commercial specifications and standards, unless no practical alternative exists to meet the user's needs. Dr. Perry also accepted the report of the Industry Review Panel on Specifications and Standards and directed the Under Secretary of Defense (Acquisition and Technology) to appropriately implement the Panel's recommendations.

He further directed the addressees of the memorandum to take immediate action to implement the Team's recommendations and assigned the USD (A&T) overall implementation responsibility. He further directed USD (A&T) to immediately arrange for reprogramming of the funds needed in FY94 and FY95 to efficiently implement the recommendations. He directed the Secretaries of the Military Departments and the Directors of the Defense Agencies to program funding for FY96 and beyond in accordance with the Defense Planning Guidance.

The memorandum went on to spell out the policy changes and the implementation of these changes in DoD Instruction 5000.2, the Defense Federal Acquisition Regulation Supplement (DFARS), and other instructions, manuals, regulations, or policy documents as appropriate. Discussion of seven key policy changes follows:

## **1. Military Specifications and Standards**

Performance specifications are used when purchasing new systems, major modifications, upgrades to current systems, and nondevelopmental and commercial items for programs in any acquisition category. If it is not practicable to use a performance specification, a non-Government standard is required. There will be cases when military specifications are needed to define an exact design solution because there isn't an acceptable non-Governmental standard or because the use of a performance specification or non-Government standard is not cost effective. The use of military specifications and standards is authorized only as a last resort and requires an appropriate waiver.

The Milestone Decision Authority must approve waivers for the use of military specifications and standards. In the case of acquisition category 1-D programs, waivers can be granted by the Defense Acquisition Executive, or a designee.

## **2. Innovative Contract Management**

The USD (A&T) within 60 days of the memo was to develop DFARS language to encourage contractors to propose non-Governmental standards and industry-wide practices that meet the intent of the military specifications and standards. The language was to be developed for inclusion in both requests for proposals and in on-going contracts. These standards and practices were to be considered as alternatives to those military specifications and standards cited in all

new contracts expected to have a value of \$100,000 or more, and in existing contracts of \$500,000 or more having a substantial contract effort remaining to be performed.

Furthermore, Secretaries of the Military Departments and the Directors of the Defense Agencies were to exercise their existing authority to use solicitation and contract clause language. Government contracting officers were to expedite the processing of proposed alternatives to military specifications and standards and were encouraged to use Value Engineering no-cost settlement method in existing contracts.

### **3. Management and Manufacturing Specifications and Standards**

Program managers would use management and manufacturing specifications and standards for guidance only. The USD (A&T) was to develop a plan for canceling these specifications and standards, inactivating them for new designs, transferring the specifications and standards to non-Government standards, converting them to performance based specifications, or justifying their retention as military specifications and standards.

### **4. Configuration Control**

To the maximum extent practicable, the Government should maintain configuration control of the functional and performance requirements only, giving contractors responsibility for the detailed design. Configuration control or management is broken down into four primary functions: 1) Identification, 2)

Change Control, 3) Audits, and 4) Status Accounting. The goal of this process is to control the system products, processes, and documentation. Through the use of performance based contracting the Government continues to control the products, but allows industry to determine the processes necessary to meet the programs' performance objectives. It also looks to shift from the use of oversight, through intense scrutiny of how the contractor is performing the process, to one of insight, where an atmosphere of trust is developed and the Government is focused on the end results.

## **5. Obsolete Specifications**

The *Department of Defense Index of Specifications and Standards* and the *Acquisition Management System and Data Requirements Control List* contain outdated military specifications and standards and data requirements that should not be used for new development efforts.

## **6. Use of Non-Government Standards**

Secretary Perry encouraged the USD (A&T) to form partnerships with industry associations to develop non-Government standards for replacement of military standards where practicable. The Under Secretary was further directed to adopt and list in the *DoD Index of Specifications and Standards* (DODISS) non-Governmental standards currently being used by DoD. The Under Secretary was also to establish teams to review the Federal supply classes and standardization areas to identify candidates for conversion or replacement.

## **7. Reducing Oversight**

The Secretaries of the Military Departments and the Directors of the Defense Agencies were to reduce Government oversight by substituting process controls and non-Government standards in place of development and/or production testing and inspection and military unique quality assurance systems.

## **8. Cultural Changes**

Secretary Perry also addressed the cultural changes that this new policy would create. He expected Program Managers and acquisition decision-makers at all levels to challenge requirements because the problem of unique military systems does not begin with the standards. The problem is rooted in the requirements determination phase of the acquisition cycle. The USD (A&T) was to ensure training and education programs throughout DoD were revised to incorporate specifications and standards reform. Program reviews by the Milestone Decision Authority (MDA) at all levels were to include consideration of the extent streamlining, both in the contract and in the oversight process, was being pursued. The MDA would be responsible for ensuring that progress is being made with respect to programs under his/her control. [Ref. 3:pp. 1-4]

## **C. THE ACQUISITION PROCESS**

The DoD 5000 series is a set of directives and instructions originally issued in 1991. Over the last several years, these regulations have evolved to the present 1996 DoD release of DoD Directive 5000.1, *Defense Acquisition* [DoD], and DoD

5000.2-R, *Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information Systems (MAIS) Acquisition Programs*. [DoD] These replaced the 1991 versions of DoDD 5000.1, DoDI 5000.2, and DoDI 5000.2M and 8000 series.

All the military departments are subject to the guidance provided in the 5000 series, which provide a single acquisition system for all defense acquisition programs. The 5000 series is implemented in a phased process with four major milestones: 1) Milestone 0: Approval to Conduct Concept Studies, 2) Milestone 1: Approval to Begin a New Acquisition Program, 3) Milestone 2: Approval to Enter Engineering and Manufacturing Development, and 4) Milestone 3: Production or Fielding/Deployment Approval. Each milestone involves a major programmatic decision point and authenticates the previous phase of acquisition.

#### **1. Determining Mission Needs and Identifying Deficiencies**

The acquisition Process begins with the identification, documentation, and validation of mission needs. Mission needs result from ongoing assessments of current and projected capability. Mission needs may seek to establish a new operational capability, or to exploit an opportunity to reduce costs or enhance performance. DoD Components must first try to satisfy mission needs through nonmaterial solutions, such as changes in doctrine or tactics. If a nonmaterial solution is deemed infeasible, the Component must document its considerations and determine whether the potential material solution could result in and

Acquisition Category (ACAT) I or IA program. If the potential material solution could result in a new ACAT I, the Joint Requirements Oversight Council (JROC) will review the documented mission need, determine its validity, and establish joint potential. If the potential solution could result in a new ACAT IA, the appropriate Office of the Secretary of Defense Principal Staff Assistant or the JROC will review the documented need, determine its validity, establish joint potential, and confirm that the requirements defined have been met. After the JROC validates the mission need for an ACAT I program, the USD (A&T) will convene a Milestone 0 Defense Acquisition Board (DAB) to review the mission needs statement and determine whether the need for moving to the Concept Exploration Phase is in the best interest of DoD.

## **2. Concept Exploration**

Phase 0 is the Concept Exploration Phase. The phase usually consists of competitive, parallel short-term concept studies. The focus of these efforts is to define and evaluate the feasibility of alternative concepts and to provide a basis for assessing the merits of these concepts at the Milestone 1 decision point. Analysis of alternatives will be used as appropriate to facilitate comparisons of alternative concepts. The most promising system concepts will be defined in terms of broad initial objectives for cost, schedule, performance, software requirements, opportunities for tradeoffs, overall acquisition strategy, and test and evaluation strategy.



The Milestone 1 decision point will determine if the results of the Concept Exploration Phase warrant establishing a new acquisition program and to approve entry in Phase I, Program Definition and Risk Reduction (PDRR).

### **3. Program Definition and Risk Reduction**

Phase I is the Program Definition and Risk Reduction Phase. During this phase, the program will become defined as one or more concepts, design approaches, and/or parallel technologies are pursued as warranted. Assessments of the advantages and disadvantages of alternative concepts will be refined. Advanced Concept Technology Demonstrators, prototyping, demonstrations, and early operational assessments will be considered and included as necessary to reduce risk so that technology, manufacturing, and support risks are well defined before the Milestone II decision point. Cost drivers, life-cycle cost estimates, cost-performance tradeoffs, interoperability, and acquisition strategy alternatives will be considered to include evolutionary and incremental software development.

The Milestone II decision point will determine if the results of the PDRR Phase warrant continuation of the program and to approve entry into the Engineering and Manufacturing Development (EMD) Phase. The Low Rate Initial Production (LRIP) strategy will be considered at this point.

### **4. Engineering and Manufacturing Development**

Phase II is the Engineering and Manufacturing Development Phase. The primary objective of this phase is to translate the most promising design approach

into a stable, interoperable, producible, supportable, and cost-effective design. It will also validate the manufacturing or production process and demonstrate system capabilities through testing. LRIP will occur and will continue as test results and design fixes or upgrades are incorporated.

During this phase, the Milestone III decision point will be reached. The purpose of this milestone is to authorize entrance into Phase III, Production, Fielding/Deployment, and Operational Support.

#### **5. Production, Fielding/Deployment and Operational Support**

Phase III is the Production, Fielding/Deployment, and Operational Support phase. It is used to achieve operational capability and satisfy mission needs. Deficiencies encountered during testing will be resolved and fixes verified. During fielding/deployment and throughout operational support, the potential for modifications to the fielded/deployed system continues. [Ref. 4:pp. 3-7]

#### **D. COMPARISON OF TRADITIONAL AND PERFORMANCE BASED CONTRACTING**

In order to understand traditional and performance based contracting, we must look at the key differences between the two. This is not to say that performance based contracting does not use the same flow as traditional contracting, but that there are inherent differences in the way the contract process is viewed from a program management perspective. The following table summarizes the differences:

<b>ASPECT</b>	<b>TRADITIONAL</b>	<b>PERFORMANCE BASED</b>
<b>REQUIREMENTS DETERMINATION</b>	Done through use of detailed specifications and processes	Done through use of performance specifications and objectives
<b>STATEMENT OF WORK</b>	Detailed specifications and processes provided to contractor, deviation not allowed without prior approval	Focuses on outcome desired and leaves the how to contractor
<b>QUALITY ASSURANCE</b>	Oversight, detailed inspections and audits	Insight, surveillance plans, use of ISO 9000 and 14000 standards
<b>SELECTION PROCEDURES</b>	Emphasis on lowest cost, minimum acceptable technical capability	Use of competitive negotiations, best value approach
<b>CONTRACT TYPE</b>	Fixed-price or cost-reimbursement with very few awards or incentives	Fixed-price or cost-reimbursement with an emphasis on award/incentive type arrangements
<b>REPETITIVE REQUIREMENTS</b>	Doesn't take into account when detailed specifications are no longer necessary	Statements of work and surveillance plans more definitive than previous acquisitions
<b>MULTIYEAR CONTRACTING</b>	Detailed specifications and processes inhibit use of multiyear due to complexity of requirement	Preferred method, increase competition offers more stable long-term contracting environment
<b>CONTRACT ADMINISTRATION</b>	Simple when compared to performance based	Complex due to administration of award/incentive clauses

Source: Developed by Researcher.

**Table 2.1. Comparison of Traditional and Performance Base Contracting**

## **1. Requirements Determination**

For contracting for major systems, this falls in line with the mission needs analysis of the acquisition process. The Procuring Contracting Officer (PCO) in coordination with the Program Manager (PM) will ensure the documentation for the program, prior to officially awarding a contract, address all technical, business, management, and other activities that will control the acquisition. This must be updated during every phase of the program to ensure accuracy. Under traditional contracting the requirements are spelled out through the use of detailed specifications. The Government tells the contractor how they want the work accomplished. Under performance based contracting the requirements are done through the use of performance based specifications and objectives. The Government tells the contractor what it desires, but not how to do it.

## **2. Statement of Work**

The performance based statement of work focuses on the outcomes desired or the final product or services to be delivered and leaves the how to the individual contractor. This approach emphasizes mission accomplishment rather than the detailed processes and procedures used to attain the mission accomplishment. This is a significant departure from statements of work in the traditional approach where the detailed specifications are provided and the contractor is not given the authority to deviate from the procedures agreed upon without prior approval. To assist in refining statements of work, considerations should be given to issuing

draft solicitations. This will assist in ensuring the statements of work are understood to be performance based in the eyes of the contractor and clear up any misunderstanding of the requirements prior to proposal submission.

### **3. Quality Assurance**

The use of the International Organization for Standardization (ISO) 9000 for services and 14000 for manufacturing certification insures the Government selects a company with proven experienced quality and environmental processes through an effective configuration control methodology. Agencies should develop formal, measurable performance standards and surveillance plans to facilitate the assessment of contractor performance and the use of performance incentives and deduction schedules. Agencies should avoid relying on cumbersome and intrusive process oriented inspection and oversight programs to assess contractor performance. The big difference here as opposed to traditional contracting is the emphasis on insight versus oversight.

### **4. Selection Procedures**

Agencies shall use competitive negotiations for acquisitions where the quality of performance over and above the minimum acceptable level will enhance agency mission accomplishment and justify the corresponding increase in cost. This approach will apply to most DoD programs. This is a departure from past practices where the emphasis is on lowest cost and minimum acceptable level of technical capability. The traditional approach doesn't attempt to exceed minimum

performance parameters or use cost benefit analysis. In PBC selections, contracting activities should give careful consideration to developing evaluation and selection procedures that utilize quality related factors such as: technical capability, management capability, cost realism, and past performance. These factors should receive increased emphasis to the extent requirements are more complex and less clearly defined. The desired relative importance among these factors and between these factors and price shall be determined, and they shall be applied as stated in the solicitations. To ensure application of cost realism, cost proposals shall be reviewed to assess offerors' understanding of the requirement and consistency with their technical proposals. Special attention shall be directed to limited opportunities for technical leveling and technical transfusion. Technical leveling and technical transfusion discourages offerors from proposing innovative methods of performance and often results from repeated discussions and the submission of revised offers based on these discussions. Opportunities for discussions and revisions of offers shall be limited to the extent practicable. Sealed bidding shall be used when the goal of the acquisition is to achieve the desired product or service at the lowest price with minimum stated acceptable quality. Sealed bidding will mainly apply in the area of service contracts and not to major systems acquisitions. The use of sealed bids in PBC mainly differs in the performance based specifications versus the traditional use of detailed specifications.

## **5. Contract Type**

Contract types most likely to motivate contractors to perform at optimal levels shall be chosen. Fixed-price contracts are appropriate for goods or services that can be objectively defined and for which risk of performance is manageable. For such acquisitions, performance based statements of work and measurable performance standards and surveillance plans shall be developed and fixed-price contracts shall be preferred over cost-reimbursement contracts. Cost-reimbursement type contracts are appropriate for goods or services that can only be defined in general terms and for which the risk of performance is not reasonably manageable. Complex or unique systems for which quality of performance is paramount frequently fall into this category. Furthermore, to the maximum extent practicable, contracts shall include incentive provisions to ensure that contractors are rewarded for good performance and quality assurance deduction schedules to discourage unsatisfactory performance. These provisions shall be based on measurement against predetermined performance standards and surveillance plans. It is this emphasis on the use of incentive type contracts that makes performance based contracts separate themselves from the regular fixed-price and cost-reimbursement contracts that have been used by programs in the past. The idea is to reward contractors for being creative and innovative and making them more of a stakeholder in the project at hand.

## **6. Repetitive Requirements**

When acquiring systems that have previously been provided by contract, agencies shall rely on experience gained from prior contracts to incorporate performance based acquisition methods. For such follow on requirements, statements of work shall further describe the requirement in terms of what is to be performed and performance standards and surveillance plans shall be more definitive than those for the prior acquisition. Where appropriate, as in a mature technology, conversion from a cost-reimbursement to a fixed-price arrangement shall be accomplished and, whenever possible, incentive provisions and quality assurance deduction schedules shall be introduced. In contrast, traditional contracting tends to rely on the use of detailed specifications and doesn't take into account when those specifications are no longer necessary.

## **7. Multiyear Contracting**

Agencies with statutory multiyear authority shall consider the use of such authority when making acquisitions. The use of such authority will increase competition by offering a more stable, long-term contracting environment. One area of emphasis in acquisition reform is the attempt to use multiyear contracts whenever possible because of the benefits that stability brings to the program. Performance based contracting is better served by the use of multiyear authority due to the contractor being able to take advantage of long term planning in implementing strategies for achieving the performance objectives called for in the



statement of work. Traditional contracting is not able to use this to the same advantage due to the use of detailed specifications and processes. [Ref. 1:pp. 1-3]

## **8. Contract Administration**

After the Government and the contractor have entered into a contract, the contract administration phase begins. Both parties have duties and responsibilities associated with their role in the performance of the contract. The Government will act through the contracting officer and perform the functions of direction, administration, surveillance, acceptance and payment. The contractor is challenged to perform services and provide end items and related deliverables. The contractor must do this in accordance with the terms and conditions of the contract. It is extremely important that changes to the contractual arrangement between the parties are managed properly. [Ref. 5] The challenge with performance based contracts in the area of contract administration is the complexity level is increased due to the administration of award/incentive clauses. Failure to manage this properly can be disastrous to the relationship between the Government and the contractor.

## **E. SUMMARY**

This chapter provides an overview of the Acquisition Process and the traditional and performance based roles of contracting. It also presents the historical perspective of what has led us to the use of performance based contracting within the Department of Defense. Chapter III provides an overview

of the research methodology used in determining the answers to the primary and secondary research questions.



### **III. METHODOLOGY AND PROGRAM BACKGROUND**

#### **A. INTRODUCTION**

This chapter presents the methodology used to investigate the views and use of performance based contracting in DoD acquisition programs. The research method is defined by the research objectives concerning the use of performance based contracting. The primary objective is to learn, from those involved with performance based contracting, the benefits and disadvantages of using the process. This will allow an analysis of the area of performance based contracting in order to develop guidelines to improve the effectiveness of its use.

#### **B. METHODOLOGY**

The research methods used to answer the research objective have consisted of interviews, which have been conducted face-to-face, by telephone, and through electronic mail. These interviews have been with personnel involved in the area of performance based contracting from both industry and Government. The researcher also has conducted a literature review on performance based contracting seeking current articles and regulations on the subject. Lastly, the researcher has also specifically selected three current, major acquisition programs as case studies to explore the methods used and decisions made by various key personnel within the program offices in using performance based contracting. This also has allowed the researcher to determine, on a limited basis, how the programs are

using the performance based contracting approach under different program management office scenarios. These methods are discussed below.

### **1. Face-To-Face Interviews**

Face-to-face interviews were used to collect current views and opinions. The researcher has created a list of open-ended interview questions (See Appendix B). These questions have been designed to solicit responses that will answer the primary and secondary research questions presented in Chapter I. The researcher has requested, and in all cases, received permission to tape record the interviews. Prior to conducting the face-to-face interviews, the interviewees have been informed of the purpose of the interview and that their answers will not be subject to attribution. Each session lasted between 30 and 45 minutes. All interviews, after completion on the mini-tape recorder, have been transcribed and compiled into a format that allows the data to be summarized and analyzed. The interviewees were not given the list of questions in advance as, in the majority of cases, it was not feasible to provide the questions beforehand. Five interviews have been conducted using this format.

### **2. Telephone and Electronic Mail Interviews**

Telephone and electronic mail interviews have also been used to collect current views and opinions. The researcher has sent the list of interview questions to the interviewees and given the interviewee the option to respond by electronic mail or through the use of a telephone interview. These respondents have been

given at least two weeks to respond to allow for a reasonable response time. All responses that were received have been transferred and compiled into a format that allows the data to be summarized and analyzed. The researcher received responses from six out of twelve potential interviewees using this format.

### **3. Literature Review**

The use of a literature review has been critical to understanding the performance based contracting concept. The researcher has used several resources to accomplish this. A search through the Naval Postgraduate School library was conducted to find those regulations or theses that have been conducted in the area of performance based contracting and the three programs selected as case studies.

### **4. Case Studies**

In order to do an analysis of how performance based contracting has worked in DoD acquisitions; it is necessary to examine current DoD acquisition programs to develop an understanding of how the process is working. The programs selected are the U.S. Marine Corps' Advanced Amphibious Assault Vehicle Program (AAAV), the U.S. Army's 2 ½ ton truck Extended Service Program (ESP), and the U.S. Navy's Landing Platform Dock 17 (LPD-17) ship program. These programs have been chosen by the researcher as a cross section of not only three different Services, but also three different types of systems and approaches to program management. These programs all used teaming, which has been identified as an essential element for succeeding at performance based

contracting. [Ref. 6:p. 2] This allows for a much better possibility of determining where PBC is used similarly in each of these programs and when it is used differently. The case studies of each of these programs consist of researching the background of the program and determining the framework program management structure for each. Each of these programs will be described separately so that the distinctions between them can be made. In all cases, none of these programs has been completed and a conclusion as to the long term success or failure of the use of performance based contracting can not be made at this time. The researcher was limited in the amount of information currently available on these cases due to the sensitivity of some of the information regarding the programs.

## **C. CASE STUDIES**

### **1. Advanced Amphibious Assault Vehicle Program**

#### ***a. Background***

During the late 1980s, the Navy and Marine Corps began developing new operational concepts for the employment of Naval Expeditionary Forces. These concepts, developed in response to the collapse of the Soviet Union, the increase in regional conflict and the use of military forces for operations other than war, were published in the Department of the Navy's...*From the Sea*. [Ref. 7:p. 65] Part of the overall concept for employing Naval forces addressed projecting power ashore using the sea, air and land as a continuous maneuver space. The current Marine Corps Assault Amphibious Vehicle (AAV) is inadequate to

execute the high-speed maneuver envisioned in...*From the Sea*. The Marine Corps identified the need for a new assault amphibian that was cable of over-the-horizon operations and attaining a water speed of 24 knots. During the Concept Exploration phase, 13 alternatives were evaluated to meet the operational requirements. The Advanced Assault Amphibian Vehicle was determined to be the most effective means of meeting the requirements for speed, maneuverability and survivability. Two contractors, United Defense Limited Partnership and General Dynamics Land Systems, competed for award of the Program Definition and Risk Reduction (PDRR) contract. The PDRR prime contract was awarded to General Dynamics Land Systems in June 1996.

The Government has included, in the Request for Proposals, the intent to use Integrated Product and Process Development (IPPD) concepts and Integrated Product Teams (IPTs) to plan and execute the program effort. Further, the Government requires each offeror's proposal to include the establishment of a facility where the contractor and Program Management Office (PMO) could be collocated. To facilitate collocation with the Government, General Dynamics formed a new division, General Dynamics Amphibious Systems, to perform the contract. They are currently located with the PMO in a facility in Woodbridge, Virginia. [Ref. 7:pp. 65-66]



*b. Organization of Program Office*

The Program Manager for AAASV has developed a large, highly projectized staff. The program office is structured around seven areas of responsibility: AAASV personnel variant, AAASV communications variant, engineering, logistics, operations, business and finance, and contract management. The program office structure developed by the PM is driven by several factors. The use of IPPD and IPTs to manage the program requires a large staff to provide participants in each of the 23 program IPTs. These IPTs meet on a daily or weekly basis, requiring a significant time investment from the participants. The reliance on IPTs requires that all Government members have a clear understanding of the issues involved, the limits of their authority to make decisions, and a chain of command to raise issues that cannot be resolved at their level. Successful IPTs rely on the commitment of top management for effective problem resolution and empowerment of participants. By maintaining a projectized PMO, the PM of AAASV chose a structure that simplified the lines of communication and authority.

The size and complexity of the integration effort required to develop the AAASV have also contributed to the PMO structure. The AAASV is the only ACAT I program in the Marine Corps dealing with ground combat systems. Although much of the technology in the subsystems is non-developmental, the integration of these subsystems entails a moderate level of risk. The Marine Corps Systems Command (MARCORSYSCOM) does not have the depth and breadth of

technical expertise to provide full matrix support to AAV and to support those programs for which it has operational responsibility. [Ref. 7:p. 73] The AAV program is using an award fee type contract. This has been instrumental in the PM receiving the performance desired out of this state of the art combat system. It does require extra work from the contract administration standpoint, and has been unique in that the award fee is shared directly with the employees working on the program and not just given to the corporation. [Ref. 8]

## **2. 2 ½ Ton Extended Service Program**

### ***a. Background***

The 2 ½ Ton Extended Service Program (ESP) is an ACAT III program under the control of the PEO for Ground Combat and Support Systems (GCSS). The contract was awarded in September of 1993 to the AM General Corporation. The goals of this program are to reduce operating and support costs, extend the useful service life, and provide safety and operational improvements to the current over-age fleet of vehicles. ESP is a remanufacture and vehicle improvement program to convert a portion of the medium tactical vehicle fleet to a standard configuration that will enhance performance and supportability, meet military specifications, and conform to current safety and environmental standards. The vehicles remanufactured are the M44A2 series 2-½ ton cargo trucks with three variations: fixed side cargo, dropside cargo, and long bed cargo. The ESP vehicles will incorporate a new engine, new automatic transmission, new

or rebuilt transfer case, new central tire inflation system, and rebuilt axles. These vehicles will also have new subsystems in the areas of brakes, power steering, hoses, exhaust, electrical, fuel lines/tank, cooling system, hydraulics, radial tires, CARC paint, and a simplified test equipment/internal combustion engine reprogrammable diagnostic connector assembly. These vehicles provide enhanced mobility and safety features. The vehicles are capable of performing ground transport tasks in selected combat, combat support, and combat service support missions. This program is one of the first to use performance based requirements and has been a good learning tool for use of PBC in follow-on programs. Some of the lessons learned include the contractor using the lowest cost method to meet performance requirements, writing performance based specifications, and having to use detailed specifications to ensure that safety standards are met. The contractor used lowest cost products in some system items since the parts met the performance requirement. The problem is that the Government wanted higher quality. This has caused the program to provide the timely lesson of how important it is to write performance based specifications correctly without making them into detailed specifications. Making the adjustment to performance based specifications was a labor- intensive effort since the organization does not have any prior experience with performance based specifications. The waiver process has been tested since there are safety requirements that can't be expressed in performance based terms. The use of detailed specifications is the only way the

PM can ensure that the requirements have been met for this program. The process has caused delays that were not necessary if the waiver process had been simplified. [Ref. 9:pp. 1-2]

***b. Organization of Program Office***

The program office for the ESP program was not collocated with the contractor. The program is one of the first to implement the use of performance based contracting in the Army. The structure of the office is more along traditional lines, but the use of IPPD and IPTs is present. By saying the office is setup more along traditional lines, the researcher is referring to the fact that work centers are setup by functional areas as opposed to the cross functional setup of the AAV program. Due to funding constraints and the fact that performance based contracting was implemented after initial award, the program office has had the challenge of streamlining and meeting schedule under a tight cost control environment. This has not been the case in the other two programs studied since they are ACAT 1 programs with high visibility and a political backing for ultimate success.

**3. Landing Platform Dock 17 Program**

***a. Background***

The Landing Platform Dock 17 (LPD 17) is the latest class of amphibious force ship for the United States Navy. The mission of LPD-17 ships is to transport Marines, with helicopters and air-cushioned landing craft to trouble

spots around the world. The first ship, the San Antonio LPD-17, is currently under construction and is scheduled to be delivered in November 2002. In December 1996, the U.S. Navy awarded a \$641 million contract to an industrial alliance led by Avondale with Bath Iron Works and Raytheon Company (formerly Hughes Aircraft Company, now a subsidiary of Raytheon) to design and construct the first of an anticipated twelve ships under the Navy's LPD-17 program. The contract award provides for the Navy to acquire two additional LPD-17 ships to be built by the industrial alliance. Under the terms of the agreement between the alliance members, Avondale will build the first of class ship and if the Navy exercises the two options, Avondale will construct the second and Bath will construct the third of the three LPD-17 ships to be built under this initial contract. Raytheon is responsible for total ship integration. Avondale, Bath Iron Works and Raytheon are using an advanced three-dimensional ship design and modeling technology for the design and manufacture of the ship, which will be of all steel construction. Survivability features incorporated into the structure include radar cross-section reduction, a collective protection system, fragmentation protection and shock hardening, and an advanced degaussing system to reduce the magnetic signature. [Ref. 10:p. 1]

***b. Organization of Program Office***

The LPD-17 program office has been organized to take advantage of acquisition reform. It has selected a full service contractor team that includes two

shipbuilders and one integration agent with experience in the design, development, engineering and production of advanced technology systems. This team will be sustained over the acquisition and service life of LPD-17 Class ships through at least the year 2040. The Navy hopes to gain from this long-term relationship, specifically by assimilating the expert knowledge available through streamlined contractual relationships, and the flexibility of the commercial sector to respond to urgent emerging requirements. Industry teams have been formed in the expectation of a long-term, broad-based commitment, and with the strengths and capabilities of each member in mind. LPD-17 has also established a Navy and industry Integrated Product and Process Development team that will exist for the life of LPD-17 Class ships and future derivatives. Unlike most shipbuilding programs, this Navy-industry team is established at the prime contractor's site in New Orleans, Louisiana. This team was not placed in Washington D.C, so that real-time, continuous process streamlining can be achieved. In previous Navy shipbuilding programs, the Navy team was located in Washington D.C., and the ability to streamline the process was not practicable due to the communication problems caused by the separation of the teams. The full service contractor is capable of procuring, or if necessary leading the development of, selected sensors, weapons, and other digital systems under the direction of the Navy through the IPPD team. It is through this team that the Navy is ensuring technical obligations, including safety, are achieved. This procurement of ship systems by the full

service contractor is designed to be superior to previous practices because the contractor team has more expert knowledge of all requirements. In previous ship systems the approach was the shipbuilder had no systems integration team member and the shipbuilder lacked prior weapons system development expertise or experience. The full service contractor sustainment for the life of the ships will facilitate reduction in infrastructure and help to provide superior logistics service support to the fleet. [Ref. 11:p. 1]

#### **D. SUMMARY**

This chapter provides the methodology used by the researcher to answer the primary and secondary research questions. This chapter also discusses the background and the organization of the program management offices of the three systems studied for the purpose of designing a baseline for answering the primary research question. Chapter IV provides an analysis of the data collected by the researcher.

## IV. DATA ANALYSIS

### A. INTRODUCTION

This chapter provides an analysis of the data collected by the researcher in order to answer the primary and secondary research questions. The data are included as part of the analysis. The providers of the data are not identified as agreed upon by the parties during the interview process.

### B. DATA ANALYSIS

The analysis is presented in the form of the interview questions posed and the responses received, followed by analysis. A complete listing of respondents is provided in References 8 and 12 through 21.

1. **Has the implementation of performance based contracting (PBC) helped or hurt your program and how has it helped or hurt?**

- a. *How PBC Has Helped*

The general consensus among all interviewees is that PBC has helped their programs. Respondents indicated that PBC is an effective way to obtain cost savings and a high level of performance. Though the consensus is that there is a cost savings, until the programs identified in the case studies are completed, this can't be proven conclusively. Test results indicate that significant savings may be achieved. The respondents stated that PBC keeps the focus on the outcome and the product or services provided. The approach emphasizes mission accomplishment rather than the detailed process and procedures used to



accomplish the mission. Some of the Government respondents think that PBC has caused the PM and the potential end user of the acquisition program to open up better channels of communication. This communication has made the PM research the requirements more than previously, and has given the PM a better understanding of the performance specification requirements desired by the user.

Bock, in his thesis *A Study of the Impact of Acquisition Reforms on Pre-Award Solicitations*, finds, in the study of six Air Force acquisition programs, a reduction in the number of pages required in the Statement of Work of 93 percent. He further finds the number of military specifications required have been reduced by 99.2 percent. He concludes that the learning curve in the use of RFPs will take effect and allow future RFPs to take less time. [Ref. 22:pp. 37-41]

The responses from industry indicate that PBC has been received in a positive way. It allows the contractor flexibility that is not available with the use of detailed specifications. Industry is allowed to use its creativity to the fullest, and is not placed in the restrictive environment that is present under the detailed specification process. In programs that have transitioned during the change to PBC, it aided significantly in that detailed specs were changed or deleted. This is especially true in the case of the ESP program. The AAV program has been able to take advantage of the performance based specifications since the program's inception. In the case of the LPD-17 program, shipbuilders find that PBC is

helpful. However, it is difficult to transition fully to PBC due to the complexity of ship design and technology.

In the analysis of how PBC has helped programs, one area where the majority of respondents agree is in determining requirements. The notion is that PBC has caused the PM to research requirements more so than in the past. This is leading to the process ending up with better specifications. The research of requirements has created a dialogue between the PM and the end user that has not been previously present. Open dialogue appears to be one of the major reasons for the use of PBC, as it gives program managers flexibility in selecting the best potential product for their program even if the PM doesn't have an idea of what the end item should look like initially. As determined by Bock's study, this can lead to improved performance specifications that are permitting the PM to release a significantly improved RFP much earlier than previously practiced. The size of the RFPs has decreased significantly with programs that are using PBC.

***b. How the Process Has Changed***

Some of the respondents stated that intuitively, PBC is the wave of the future and, from a commercial standpoint, this is how industry does PBC. It has changed the way Government and the contractor do business for the benefit of all parties involved. The contractor has been allowed to determine how to provide the required capability. This approach has allowed offerors to propose alternative

means of achieving the required capability and allows the Government to make a best value source selection and reduce total ownership cost.

In the analysis of how PBC has helped the process, it is too early in the transition to this process to determine if total ownership costs have been reduced and if both parties are benefiting from this arrangement. However, test results indicate that the potential for life cycle cost savings is significant. The ESP has a goal of 2,400 Mean-Miles-Between-Hardware Mission Failures (MMBHMF) and has achieved a rate of 11,322 MMBHMF.

*c. How PBC Has Hurt Programs*

Even though the consensus is that PBC has helped programs, there are some areas where respondents think that PBC hurts their programs. One Government concern is that contractors do not understand the concept of performance based specifications. This can especially be the case with non-developmental items and with companies that traditionally do not work in the commercial sector. These companies, like the Government, are still in the learning process. Respondents think this can be addressed through the use of past performance data. As we collect past performance data on companies, they are forced to improve themselves or run the risk of losing Government business, and potentially, this could lead to collapse of companies that are significantly reliant on Government business.

There is a perception by some respondents that the inability of companies to adjust to performance based contracting could lead to problems in the products prior to full-scale production. For example, a contractor may use an inexpensive part that has a higher likelihood of failure. This may not be readily identifiable to the PM until the testing phase. This may cause an increase in costs in order to reach the desired performance objective since the part may have to be replaced.

Another problem brought forth by respondents is schedule delays occurring for items that have no corresponding commercial specification and PMs have to be careful if technical data packages are purchased. Once the Government owns the technical data package, it can absolve the company from future performance problems if the interpretation is that ownership equals performance responsibility. With the amount of expertise in the Government regarding technical specifications decreasing, there is a danger that the technical data package will cause more litigation and less cooperation. Especially with non-developmental items, components tend to change so a new company will not necessarily be able to build the product based on the technical data package.

In the analysis of how the implementation of PBC has hurt programs, it is obvious that companies and the Government can interpret things differently regarding specifications, even when they are both viewing the same written document. This makes it extremely important for PMs and their staffs to

work closely with the contractor to ensure that the requirements are understood completely. The use of past performance appears to be a key element in the successful implementation of PBC. This element can lead to a more competitive environment as lessons are learned from the mistakes of the past. The Government needs to be careful when considering the purchase of technical data packages. Based on the responses received, the PM must understand the implication of purchasing these packages and ensure that this is in the best interest of the acquisition program.

**2. How have DoD policies on performance based contracting helped or hindered your implementation of performance based contracting?**

***a. How Policies Have Helped***

Most of those interviewed indicate that DoD policies haven't really made an impact on the implementation of performance based contracting in their programs. In some cases, the respondents indicate the emphasis on performance based contracting has not emerged early enough to strongly impact their program's development. Though the consensus is that the policies haven't impacted the implementation of PBC, those interviewed think the policies are helpful. They indicate the policies have been well thought out by the visionaries, Dr. Perry and Dr. Kaminski. This leadership has allowed PBC to move forward as much as it has, along with the theme of acquisition reform being embraced by the workforce at large.

Most think the biggest delay in implementation has been the required cultural change as opposed to the ability to implement reforms. Respondents from industry stated that lack of cultural change is not compartmentalized to DoD. Industry has its own unique cultural problems, and it can even be said that industry has a harder time implementing the changes in the culture because of the personality and character of its workforce being much more diverse.

In the analysis of whether DoD policies on PBC have helped implementation of PBC, the policies themselves appear to have had little impact on implementation. From the Government and industry responses gathered, it is the ability to make lasting cultural change that allows for the ultimate success or failure of policy action.

Through the respondents and literature review, the researcher has found that DoD is a large workforce and the people at the top and bottom of this organization are more adaptable to change. Cultural change appears to be more difficult to implement at the middle management levels, even when the policy is sound. Resistance to change is pervasive and there appears to be a fear of the unknown created by the change in culture required by the new policies. Cultural change challenges are not unique to DoD, as they are shared by industry as well. The ability to overcome this challenge, not the policies themselves, is critical in the implementation of performance based contracting.

*b. How Policies Have Hurt Programs*

The consensus is that the policies are too binary. By this statement, what is meant is that the policies provided strong incentives against including detailed specifications in a relatively short period of time. Respondents stated there are still several items that do not exist in the commercial sector, and it is difficult to translate these items into performance specifications because it is not done to the same degree of detail, if at all, in the commercial sector. Waivers have to be approved even in cases where the detailed specification makes logical sense. Respondents stated that the waiver process takes significant time and effort, even when it is known that the waiver will be approved. The areas reported as being most prevalent are health and safety.

In the analysis of how policies have hurt programs, the one area of policy that appears to be a hindrance to implementation of PBC is the waiver process for using detailed specifications. In every case, respondents shared that when waivers are required the process can be streamlined. The waivers that have been approved have taken a very long time due to the increased administrative burden of briefing personnel not familiar with the processes desired. There does not appear to be a requirement to brief non-technical personnel on the waivers desired. By revising this process, there is opportunity for improvement by granting additional empowerment to the IPPD/IPT process.

**3. What changes in DoD policy regarding performance based contracting could promote or enhance its use in DoD Program Management?**

Ninety percent of those interviewed think there are no changes required. One respondent thinks that DoD policy has always encouraged using performance specifications in developmental programs. The other ten-percent do have some thoughts on policy changes. They indicated there is a need to eliminate the reliance on being in compliance with regulations, which negates the performance based work statements. One respondent thinks that DoD can create "scrub teams" that analyze RFPs prior to release to contractors to eliminate unnecessary specifications.

Many respondents think there is a need to develop polices to measure performance based contracts. Some of the measures proposed include using metrics such as page count of the RFP or statement of work. Another metric could identify the innovation brought out by the programs that have been created by the use of performance specifications.

A recurrent theme is the waiver process needs to be reviewed. Those who have commented on this say that you don't want to make it too simple or people won't change yet you don't want to make it too difficult or it will become operationally impossible. Respondents believe the waiver process depends on well meaning people with an eye for acquisition reform and that people should not be afraid to submit waivers.



Respondents think another area of policy change necessary is a very aggressive education program for all personnel involved with procurement. There is also a need for logisticians to be provided performance based measures to explain how to support systems for life cycle support. Respondents have often experienced inadequate logistical support planning and insufficient attention to the detail necessary early on in the program to control support costs later in the life cycle.

In the analysis of what changes are necessary to promote the use of PBC and its use in DoD Program Management, a major precept appears to be a change in the mindset of DoD employees. There appears to be a tendency to adhere to regulations and avoid risk when placed in scenarios where modifications to the statements of work are required or potentially beneficial. Another area that may benefit from change is defining metrics that effectively measure the cost savings or efficiency of performance based versus detailed specifications. The availability of this data could provide Program Management staffs the ability to provide better cost benefit analysis of their programs. Due to the qualitative nature of the performance based statement of work, it is difficult to define metrics that effectively measure these savings or efficiencies at this point in time.

The researcher has also found that there has not been much research into the areas of waivers, even though it is an important parameter in determining how well commercial specifications have been worked into the DoD program

management system. Further, in the area of logistical support, there appears to be increased cost in programs after production is completed if the logistical support function is not made part of the PBC process from the beginning. Lack of logistical planning could cause problems for the end user if the program manager does not address logistical support during concept exploration. This change appears to be extremely important to achieve major life cycle cost reductions.

**4. What changes can be made in the area of performance based contracting to improve the acquisition process?**

***a. Program Management Process Changes***

Respondents think that in order to improve the acquisition process and make the PBC initiative successful, the technical people who develop requirements have to be forced to use performance based specifications. It is very easy for an engineer to revert to the way he or she has successfully conducted business for, in most cases, decades. Only a person who is familiar with a product can describe the critical performance characteristics for a technically complicated product. The danger lies in maintaining a balance between requirements that will ensure successful performance without overspecifying.

Everyone interviewed acknowledges that statement-of-work writing is very difficult. Their reasoning is that when you try to conduct tradeoffs related to Cost as an Independent Variable (CAIV) and performance based specifications, DoD doesn't have much experience. Respondents indicate this is not so much an acquisition decision problem, but more of a problem with translating user

requirements. DoD users demonstrate bias towards maximum performance as opposed to satisfactory levels for the specified mission.

All of the respondents think that contracts that have an award or incentive fee lend themselves well to performance based environments. One of the challenges in using these types of contracts is the increased administrative burden placed on the contracting personnel to manage the contracts. One of the respondents shared that, since the use of award fee and incentive type contracts has just started to take hold, there is a general lack of experience in the contracting field in this area. A concern with this situation is that there is much at stake for both sides: in potential for increased costs for DoD programs, and potential for increased profits for industry contractors. This one respondent further says that mismanagement could lead to problems between the two sides that could lead to litigation and defeat the purpose of teaming.

On the logistics side, DoD needs to setup incentives that reward reliability growth. By doing this, there is a potential measure for determining how well the PM has identified the long term logistical support costs while operating in a performance based business environment. Apparently industry still thinks, to a large extent, that lowest cost is necessary for contract award.

A recurring comment is that not all contractors deal with the commercial sector, which is especially critical in the area of non-developmental

items. Performance based specifications work well with Commercial-off-the-Shelf (COTS) items. However, with more complex technological items, it becomes more difficult to implement. Making changes based on performance tends to increase program costs. Attempting to make a system perform at a higher level by raising the performance standards is not inexpensive and this increase in cost may not be warranted by the additional performance received.

The Integrated Product and Process Development (IPPD) process also has room for improvement, as well as risk management and life-cycle program considerations. This can be accomplished through empowerment of personnel, along with configuration control, to retain waiver approval authority for use of detailed specifications at the program level. There is also a need, in some cases, for detailed specifications because there is not a commercial equivalent and industry needs the requirement to be described in detail for the Government to satisfy its requirements.

In the analysis of changes to be made to the program management process, a key theme is that tailoring is necessary for PBC to be successful since each program is unique. A cookbook approach is not possible, though the general framework of the acquisition process appears to be a good benchmark. Very thorough training in the distinction of roles and missions of all team members is a must in collocation situations, as in the AAV program.

Considerations also need to be given in determining how PMs can be allowed to implement innovation into the Program Management structure. The

current structure forces the PM to be more concerned with staying on schedule, at cost, and meeting performance goals. Innovation could cause a temporary slip in one of these areas, yet more than pay for itself through reduction of life-cycle cost.

The commercial sector identified that industry has to work better, especially the supplier base, to get a better understanding of the process. One way to determine the effectiveness of PBC is to examine the process from cradle to grave. Once we have programs that have completed their life-cycle using PBC, conceivably we can attempt to determine metrics that will allow us to measure the effectiveness of PBC in the completed programs.

Based on the responses received, the cost of PBC and ramifications of reform can especially be particularly tough to gage in the case of non-developmental items. One idea drawn out of analysis of the data is to have a market review of a draft RFP that shows detailed specifications imbedded in the program. This review can search for current practices or technology that have outdated these specifications. This can also be done after contract award. There is also a possibility to contract out market research for specifications and standards since DoD is constrained by budget and personnel matters.

***b. Cultural Changes***

Half of the respondents think there isn't anything in the regulations that prevents PBC from happening, it is more the personnel at the grass roots level. The inhibitor, they say, is that PBC is different, it's new, and it is difficult to

determine the best way to train personnel to do it. They think there is a need for formal training in doing performance based specification writing throughout the engineering community. PBC has shifted the focus away from engineering and towards operational technical personnel. The viewpoint is it seems harder for engineers to get away from detailed specifications. These same respondents think there is also the requirement to make the shift from detailed specifications to performance specifications in the culture.

In the analysis of determining what cultural changes can be made in the area of PBC to improve the acquisition process, the researcher senses that a change in attitude is not only necessary in the Government, but also in industry. The challenge is determining the most effective way to implement this change.

**5. What guidelines would you recommend to a future program manager to improve the effectiveness of performance based contracting?**

***a. Program Management Issues***

Respondents recommended that the PM aggressively review the user's requirements and ensure that they are performance based and require any proof to the contrary if a detailed specification is necessary. The PM needs to engender a bias towards performance based specifications, but at the same time, not rule out the use of detailed specifications. They also suggest a strong system engineering process is necessary to make the program work. The PM and staff have to watch out for legacy or outdated specifications.

Further, it is important for the PM to work with the Contracting Officer to select the best type of contract for the program. Respondents state it is more appropriate to use incentive type arrangements under performance based contracts. The PM needs to spend time early on to get an in-depth knowledge of what the user is looking for. User feedback is critical to get performance based specifications right the first time.

There is a consensus that contract award can be shortened through the use of PBC. By allowing creativity to enter the process, the contractor is more likely to present a project that is executable without the lengthy process of determining whether all detailed specifications have been addressed by the contractor's proposal. It is essential to establish tight timelines so processes allow the PM to have control of scheduling. The Procuring Contracting Officer (PCO) needs to be closely involved and the PM should take advantage of his or her legal staff to review the contract prior to award to ensure that loophole problems can be avoided. Early engagement with industry and the user representative is also noted as necessary for effective PBC. Competition is critical and PBC can enhance it.

Respondents also indicated that each performance specification should address a functional area. This does not mean that the organization of the program office should be structured around the specifications, but that in organizing the program management structure, performance specifications are something to consider. The PM is not dictating what DoD is buying, but outlining

a range of performance objectives that are desired by the end user. This outline of the end-state or mission of the item allows the commercial sector to tell the PM what they can provide.

In the analysis of the Program Management issues for a future Program Manager, the respondents' data show an emphasis on the PM being an effective communicator. The PM also needs to keep a critical eye to the analysis of the user's requirements and incorporating the feedback of the users. The contract type selected by the PM, through coordination with the PCO, is the vehicle that will give industry the incentive to perform at a higher level. In using PBC, the use of award or incentive type contracts appears to be the preferred contract vehicle. This is due to the potential rewards or benefits that motivate the contractor to achieve the desired performance parameters. The PM, in essence, needs to show flexibility and the ability to manage a complex process. This is brought about by the fact that the PM is not only involved as the leader of the program management effort, but also has to have an understanding of the technical aspects of the process.

***b. Personnel Staffing Issues***

Respondents state it is critical to get the logistics personnel involved. In attempting to form the staff, the PM must go out and find people with experience. This experience is not only critical in the requirements and logistical areas, but in all facets of the program. This could require the hiring of expertise



from outside of the organization and could force the breakdown of the program management structure into functional areas to allow for complete traceability to each functional area through use of the systems engineering process. This is not viewed as the only way to setup the organization, as each program is unique and tailoring is highly encouraged. The PM is challenged from a leadership perspective to make his or her team members more creative and innovative.

In the analysis of the personnel staffing issues, one key is to bring logistical personnel into the program management team early and identify experts for the management of the functional and technical areas. This step appears to be critical to the success of the staffing of the program management team. This appears to be a leadership challenge for the PM and may be more important than the ability to manage the process.

**6. How has your program dealt with tradeoffs in performance based specifications considering Cost as an Independent Variable requirements?**

Not all of the respondents were able to answer this question. Those that did respond think that, overall, Cost as an Independent Variable works well. More specifically with non-developmental items, front end CAIV is noted as effective. The monitoring of the acquisition program baseline and life-cycle cost are beneficial. The problem is that the monitoring tends to occur after the fact. One concern is that there isn't a good understanding of the tradeoff process among the workforce. The ability to keep score is not very good. Some of this, the

respondents have said, is an accounting problem. DoD does not have the systems in place to accurately track such data. By the time the data are entered and analyzed, we are already committed to assemblies or sub assemblies and can't make a significant design change without increasing costs. This is especially a concern in the shipbuilding area.

Industries' thoughts are that CAIV has more to do with Government than the contractor. Respondents think empowerment of team members can allow CAIV to work well through IPPD and IPT. Another factor mentioned is that CAIV is influenced by program type. With a non-developmental item (NDI) for example, you place a majority of tradeoffs in the hands of the contractors. This, they say, goes back to the question of whether contractors are looking to cut costs or partnering with the Government. One respondent said if you can tradeoff speed, endurance, and other performance factors, you can meet 85% of the requirement and save 50% of the cost.

In the analysis of tradeoffs and CAIV, one possible way to address this issue is to use a system of required or desired scenarios and work that into the scoring system. An apparent shortfall of the system is telling the contractor what DoD is willing to do for the extra performance and finding that contractors are struggling with what level of performance they will offer. Based on the research, staffing is a problem in the ability to evaluate tradeoffs in the EMD phase,

especially on smaller programs. The Government must avoid technical leveling or transfusion by regulation.

In the final analysis, CAIV is more valuable after you understand what the proposal is going to produce for the end user. Early in the program, that understanding is much more difficult. CAIV appears to be more effective if used between prototyping and production. If the PM is going to effectively use CAIV, he or she has to have an idea of what the system will consist of. Respondents' data tend to confirm that this is more of a requirement issue as opposed to a PBC issue. CAIV is one of the initiatives that helped start the move toward PBC. Experience is gained from using it and learning from mistakes. At this point in time, we can't prove that any programs will be successful, but this is something that can be researched later.

**7. What resources have been made available to you to ensure that your program has had the ability to complete the training required to implement performance based contracting?**

The issue of training varies among the three programs. One common theme among all respondents is that training is essential. There is also a consensus that it is better for the programs to have the training done before the program commences. If this is not the case, things have to be unlearned. For example, if the program has started out using detailed specifications and is supposed to be performance based, the mindsets of the personnel have to be changed.

Formal training in doing performance based specification writing is essential. In some cases, this specification writing is being outsourced. All agencies are sponsoring training courses that either make personnel aware of, or teach them how to use, performance based contracting. One of the concerns in the area of training is there is not a single source for all PBC training.

In the analysis of the training issue, the researcher has found that each program is left to its own devices in determining how to achieve its training requirements. There is the potential to outsource the training requirements and to take advantage of industries' knowledge base to bring the Government more in line with the use of PBC in the commercial sector.

All of the programs investigated have been able to meet their training goals while in the acquisition process. None of the programs was able to conduct training prior to approval of the program, however there may be some gains available in the learning process through the identification of training requirements prior to concept exploration. Training appears to be unique to each program and must also be viewed with an eye toward tailoring. There is a significant area for further research concerning the outsourcing of PBC training that is outside the scope of this study.

### **C. SUMMARY**

This chapter has presented the data and analysis concerning the use of performance based contracting in the Department of Defense. There are six key

points that arise from this analysis. One is that it appears too early to determine if total ownership costs have been reduced or if both Government and industry are benefiting from the PBC arrangement. Nonetheless test results at least indicate good potential for savings. The second point is there is some need for policy revision, especially in the waiver process and the use of metrics. Respondents interviewed state the use of metrics and the simplification of the waiver process may result in additional savings in cost and schedule. The third point is that there is a need for cultural change from Government and industry regarding the use of PBC. The apparent resistance to change is preventing the full implementation of PBC. Fourth, PBC has created an improvement in the area of determining user requirements. This has occurred due to the channels of communication that have opened between the users and the PM. Fifth, there is a need for strong Program Managers in implementing PBC. The complexity of the Program Management structure requires a person with superb leadership and technical skills. Finally, the training environment for PBC is still in the infancy stages. There does not appear to be a single source for program offices to go to for receiving training and there is also a lack of standardization in the training that is offered. Chapter V draws conclusions and recommendations based on this analysis and provides the answers to the primary and secondary research questions.

## **V. CONCLUSIONS AND RECOMMEDATIONS**

### **A. INTRODUCTION**

This thesis examines how the implementation of performance based contracting has affected program management in the Department of Defense (DoD). Based on data and analyses, the type of contract used and the organization of the program office are influenced by the complexity of the system being developed, the duration of the contract performance period, and the willingness and ability of industry to team with the Government.

Performance based contracting, as an acquisition reform initiative, is encouraging DoD to team with industry and move in the direction of using best business practices. This may continue to cause a reevaluation of the tasks required to monitor and control performance and also shift more responsibility into the hands of the program management office and the contractor in meeting user requirements.

The need to continuously evaluate the performance based contracting effort and its impact on program management may continue well into the future. The challenge is to allow programs the freedom to pursue the best available assets for DoD without strictly defining how to accomplish the task. In the pursuit of increased performance, there also has to be a way to measure if the costs incurred under this method are superior to the traditional method of obtaining systems through the use of detailed specifications.

## **B. CONCLUSIONS**

- 1. It is too early to conclude if PBC is improving the acquisition process.**

The qualitative data collected by the researcher and analyzed in Chapter IV have been compiled from various publications and interviews. The individuals interviewed all agreed that it is too early in the reform process to determine if performance based contracting improves the acquisition process over the life-cycle of any specific program. However, test results from the ESP program indicate that the potential for life-cycle cost savings is significant.

- 2. The waiver process required to use detailed specifications slows the performance based contracting process.**

As discussed in Chapter IV, several of those interviewed see the waiver process as a problem area. In the cases where waivers have been used, the process and administrative burden to receive approval of the waivers could have been determined at a lower level.

- 3. Use of past performance data can improve the performance based contracting process.**

As discussed in Chapter IV, those interviewed think the use of past performance data will improve the use of performance based contracting by industry. Not all contractors understand this process and the use of past performance as an evaluation factor may force them to improve or risk potential loss of DoD business due to their inability to adjust to this new way of doing business.

**4. The Integrated Product and Process Development/Integrated Product Team process is integral to the successful use of performance based contracting.**

As discussed in Chapter III, and further developed in Chapter IV, IPPD and IPTs were used in all three programs studied. All personnel interviewed were of the strong conviction that this arrangement is a key in successful teaming of Government and industry necessary for the implementation of performance based contracting.

**5. It is difficult to write performance based statements of work.**

All Government representatives interviewed for this study have said that writing performance based statements of work is difficult. The performance based statement of work is unique to each program and there is a requirement to fully understand the technology and level of performance desired by the end user prior to composition of this product.

**6. Cultural change is the largest inhibitor to the successful implementation of performance based contracting.**

All personnel interviewed and information gathered from literature reviews have stated that cultural change is the biggest inhibitor to the successful implementation of performance based contracting. The workforce in both Government and industry must be convinced of the benefits before they will fully embrace PBC as a lasting change.



## C. RECOMMENDATIONS

1. **DoD should initiate a process action team to determine metrics for measuring the effectiveness and efficiency of performance based contracting.**

This team can work with personnel who have served in the programs studied by the researcher to determine an initial baseline of metrics. This team can then be chartered to identify what metrics are necessary to ensure the successful measurement of factors to determine that performance based contracting is cutting costs, accelerating schedules, and resulting in increased performance.

2. **DoD should conduct a study to determine if the waiver process for use of detailed specifications can be streamlined.**

This study can be used to determine if there is a possibility to streamline the waiver process without creating a loophole in the system that will swing momentum back towards detailed specifications. Specifically, this study should determine how changing the waiver process can improve the timeliness of approvals for waivers and the corresponding cost savings.

3. **Training in the area of performance based statement of work writing needs to be made more readily available.**

As identified in Chapter IV, performance based statement of work writing is difficult. None of the personnel interviewed for this study could point to one source for the proper training. The USD (A&T) should assign the task of determining training resources for this area to the appropriate personnel.

4. **DoD needs to establish a way to market its success stories with performance based contracting to the acquisition workforce to accelerate the cultural change necessary to allow this reform to be fully successful.**

One of the reasons that the workforce has been slow to change is a lack of understanding of the performance based business environment. Respondents did not support the notion that DoD is doing a thorough job of informing the workforce about the successes of PBC. Through efforts such as the use of videotapes, newsletters, and seminars, DoD can spread the word about the successes achieved through the use of performance based contracting. This approach, if done with enthusiasm, is likely to generate the groundswell of support necessary to accelerate the culture to embrace the concept of performance based contracting.

#### **D. ANSWERS TO RESEARCH QUESTIONS**

This section discusses the primary and subsidiary research questions posed for this thesis in Chapter I.

##### **1. Primary Research Question**

**In what respects have performance based contracts improved Department of Defense acquisitions?**

The research completed in this thesis suggests that, to this point in time, performance based contracts have improved acquisitions in the Advanced Amphibious Assault Vehicle (AAAV) Program, 2 ½ Ton Truck Extended Service (ESP) Program, and Landing Platform Dock 17 (LPD-17) Program. Areas of

improvement include the requirements determination process, specification design and the request for proposal (RFP) process. Performance based contracting is allowing the program manager flexibility in the selection of sources that will design the product desired by the end user and the program management team. The request for proposal process has been streamlined due to the reduction in size of the proposal through the elimination of detailed specifications. This allows the offerors to focus on what DoD is attempting to acquire, as opposed to how they want it produced, and has allowed the contractors to use innovation and creativity in the proposal provided to the Government. The use of past performance data appears to be a key element in the successful implementation of PBC. It may lead to a more competitive environment as lessons are learned from the mistakes of the past.

## **2.     Subsidiary Questions**

### ***a.     Subsidiary Question #1***

**What are the advantages, disadvantages, and risks associated with performance based contracting?**

It is still too early in the reform process to specify all the advantages, disadvantages, and risks of performance based contracting. This thesis has been able to identify some areas of advantages, disadvantages, and risks. In the area of advantages, respondents feel the performance levels achieved by the programs using performance based contracting are superior to the levels that would be

achieved through detailed specifications. Communication between the Government and industry is improved since the relationship becomes more of a partnership as opposed to adversarial or dictatorial. Tailoring and streamlining are easier to do in the performance based environment due to the increased flexibility of the performance based arrangement.

In the area of disadvantages, the waiver process is lengthy even in cases where the waiver will be approved on logic alone. Making changes to the desired level of performance after the prototyping stage can cause a significant increase in cost. In cases of non-developmental items, there is not always a commercial standard to compare the detailed specification to and determining how to state this standard in performance terms can be difficult. The risks associated with PBC are that it is new, there are few, if any, metrics to determine its impact, and the workforce has not fully embraced this change.

*b.   Subsidiary Question #2*

**What are the current initiatives and barriers that promote/hinder the use of performance based contracting and how can they be enhanced/mitigated?**

The current initiatives that promote the use of PBC are award or incentive type contracts. The teaming concept makes Government and industry less adversarial and leads to better communications. Tailoring is another initiative that helps PBC. Additionally, as experience is gained with the use of these

concepts, industry and Government will become more efficient in their use. The barrier to performance based contracting is cultural change. This can be mitigated through communications and the continued support of top leadership, not only through words, but with action. Because we have not had any programs go through their entire life cycle in a performance based environment, not all initiatives and barriers have been identified.

*c.      **Subsidiary Question #3***

**How can performance based contracting be changed to improve the acquisition process?**

The process itself does not need to be changed based on the results obtained from this study. As the programs using PBC evolve, this question should be reviewed to determine if this remains valid. The acquisition process will be improved by the use of performance based contracting as more personnel receive training in this area and the acquisition workforce becomes more comfortable in its use.

*d.      **Subsidiary Question #4***

**What guidelines can be used by future program managers to improve the effectiveness of performance based contracting?**

Future program managers need to establish an early dialogue with the requirements personnel to ensure that the needs of the user are fully understood. The ability to create a feedback loop with the end user and with all

parties involved in the program management process is crucial to creating the proper scope of performance desired in the product or service. The PM must ensure that all members of both the Government and industry teams understand their roles and missions as early in the process as possible.

The PM also needs to work with the PCO and legal staff prior to contract award to ensure the right contract type is used and that the Government's potential liability is minimized. The PM should hire expertise outside of the organization if necessary to insure that the staff assembled for the acquisition is the best for the particular situation. The need to include logistical personnel early in the planning phases is essential to minimizing life cycle cost and determining supportability requirements that may not be addressed by the initial requirements determination. As performance based contracting evolves, there are bound to be more guidelines that can be presented to future program managers for consideration.

#### **E. AREAS FOR FURTHER RESEARCH**

During this study, the researcher found several areas that warrant further research. There are new acquisition programs that are using performance based contracting from the very beginning. The study of how performance based contracting is being used in the source selection of the Navy's newest ship program (DD-21) and DoD's newest aircraft (the Joint Strike Fighter) will be beneficial to further developing guidelines for the use of PBC.

The study of the waiver process required to use detailed specifications in performance based programs also merits further research. This study should be used to determine the amount of schedule delay caused by this process even in cases where detailed specifications are absolutely necessary.

A study of how industry trains its personnel in the use of performance based contracting in a strictly commercial environment should be initiated. Research in this area can be used to determine what portions of this information can be tailored for use in DoD.

## **APPENDIX A. LIST OF ACRONYMS**

The following list of acronyms is provided for a common frame of reference. The acronyms were obtained from basic acquisition and contract literature and regulations.

AAAV – Advanced Amphibious Assault Vehicle

AAV – Amphibious Assault Vehicle

ACAT – Acquisition Category

CAIV – Cost as an Independent Variable

DAB – Defense Acquisition Board

DFARS – Defense Federal Acquisition Regulation Supplement

DoD – Department of Defense

DODISS – DoD Index of Specifications and Standards

EMD – Engineering and Manufacturing Development

ESP – Extended Service Program

GCSS – Ground Combat and Support Systems

IPPD – Integrated Product and Process Development

IPT – Integrated Product Team

ISO – International Standards Organization

JROC – Joint Requirements Oversight Council

LPD-17 – Landing Platform Dock 17

LRIP – Low Rate Initial Production



MAIS – Major Automated Information System

MARCORSYSCOM – Marine Corps Systems Command

MDA – Milestone Decision Authority

MDAP – Major Defense Acquisition Program

MMBHMF – Mean Miles Between Hardware Mission Failures

NDI – Non-developmental Item

PAT – Process Action Team

PBC – Performance Based Contracting

PCO – Procuring Contracting Officer

PDRR – Program Definition and Risk Reduction

PM – Program Manager

PMO – Program Management Office

RFP – Request for Proposal

USD (A&T) – Under Secretary of Defense, Acquisition and Technology

## **APPENDIX B. LIST OF INTERVIEW QUESTIONS**

1. Has the implementation of performance based contracting helped or hurt your program, and how has it helped or hurt?
2. How have DoD policies on performance based contracting helped or hindered your implementation of performance based contracting?
3. What changes in DoD policy regarding performance based contracting could promote or enhance its use in your program?
4. What changes can be made in the area of performance based contracting to improve the acquisition process?
5. What guidelines would you recommend to a future program manager to improve the effectiveness of performance based contracting?
6. How has your program dealt with tradeoffs in performance based specifications considering Cost as an Independent Variable requirements?
7. What resources have been made available to you to ensure that your program has had the ability to complete the training required to implement performance based contracting?



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